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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,593	01/15/2002	Edmund H. Crane III	1090D2	6751

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EXAMINER
KUBELIK, ANNE R

ART UNIT	PAPER NUMBER
1638	7

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,593	CRANE ET AL.	
	Examiner	Art Unit	
	Anne R. Kubelik	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12* is/are allowed.

6)☒ Claim(s) *1-11 and 18-25* is/are rejected.

7)☒ Claim(s) *13-17* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *with the application* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1-25 are pending.

2. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows: An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification of in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application, in this case Application 09/551,778, now US Patent 6,504,084, must include the relationship (*i.e.*, continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

3. The abstract is not descriptive of the instant invention, which is the maize NPR1 promoter, expression constructs comprising it, cells, plants and seeds comprising the construct, and methods of using it to express a heterologous nucleic acid in a plant. A new abstract is required that is clearly indicative of the invention to which the claims are directed. The abstract of the disclosure should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

4. The title of the invention is not descriptive of the instant invention, as above. A new title is required that is clearly indicative of the invention to which the claims are directed. Note that titles can be up to 500 characters long.

Claim Objections

5. Claims 2-10 and 13-21 are objected to because of informalities. Dependent claims are included in the objections.

There is an improper article before "nucleic" in claim 2, line 1, and claim 13, line 1, and before "promoter" in claim 8, part (a), and claim 19, part (a).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 1-11 and 22-25 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a promoter of SEQ ID NO:5, expression constructs comprising the promoter, cells, plants and seeds comprising the constructs, and methods of using the constructs to express heterologous nucleic acids in a plant, does not reasonably provide enablement for any nucleic acid that hybridizes to SEQ ID NO:5, that has 70, 80 or 90% identity to SEQ ID NO:5 or that comprises 20 contiguous nucleotides of SEQ ID NO:5, expression constructs comprising the nucleic acid, cells, plants and seeds comprising the constructs, and methods of using the constructs to express heterologous nucleic acids in a plant. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The claims are broadly drawn to a multitude of nucleic acids that hybridize to SEQ ID NO:5, that have 70, 80 or 90% identity to SEQ ID NO:5, or that are promoters comprising at

least 20 contiguous nucleotides of SEQ ID NO:5, expression constructs comprising the nucleic acids, cells, plants and seeds comprising the constructs, and methods of using the constructs to express heterologous nucleic acids in a plant.

The instant specification, however, only provides guidance for the construction of maize cDNA libraries (example 1); random sequencing of the cDNAs and library subtraction to remove redundant clones (example 2); BLAST searching of the cDNA sequences to identify one that encodes an NPR1 homolog, SEQ ID NO:1, which encodes SEQ ID NO:2, and use of that clone to isolate the genomic sequence, SEQ ID NO:3, which has as its promoter SEQ ID NO:5 (example 3); analysis of the expression of the NPR1 gene to show it is transiently expressed in the presence of pathogens and non-transiently expressed in the presence of chitosan (example 4); expression of NPR1 in maize embryos to show that NPR1 activates the expression of the PR1#81 promoter (example 5); and analysis of the effects of defense elicitors on PR1#81::GUS expression with and without the overexpression of NPR1 (example 6).

The instant specification fails to provide guidance for nucleic acids that hybridize to SEQ ID NO:5, that have 70, 80 or 90% identity to SEQ ID NO:5, or that are promoters comprising at least 20 contiguous nucleotides of SEQ ID NO:5, expression constructs comprising the nucleic acids, cells, plants and seeds comprising the constructs, and methods of using the constructs to express heterologous nucleic acids in a plant.

For example, the instant specification fails to provide guidance for exact hybridization or amplification conditions and probes/primers to use in isolation of nucleic acids other than SEQ ID NO:5. The specification also fails to provide guidance for construction of the claimed nucleic acids, or for 20, 50, 100 or 500 nucleotide fragments of SEQ ID NO:5 that have promoter activity.

Twenty base-pair long regions of a DNA fragment that has promoter activity cannot predictably be assumed to also have promoter activity. Deletion analysis of various promoters have shown that even DNA segments from the portion of a promoter region containing sequence elements thought to be most important (*e.g.*, the TATA-box) need to be longer than 20 basepairs. Maiti et al (1997, Transgen. Res., 6:143-156), in studies on a figwort mosaic virus promoter, found that smallest portion upstream of the transcriptional start site of that would support transcription was 198 basepairs long; segments of 73 and 37 basepairs did not work (Fig. 4).

Mutation of promoter sequences also produces unpredictable results. Donald et al (1990, EMBO J. 9:1717-1726) in a mutational analysis of the *Arabidopsis rbcS-1A* promoter found that the effect of a particular mutation was dependent on promoter fragment length (paragraph spanning pg 1723-1724).

Identification of the functional parts of promoters is unpredictable. Chen et al (2000, Sex. Plant Reprod. 13:85-94) teach that two promoters with similar expression patterns have major differences in the expression elements required for expression in various flower parts (pg 92, right column, last two paragraphs).

The region of a given promoter that has a specific activity cannot be predicted and involves the complex interaction of different subdomains (Benfrey et al, 1990, Science 250:959-966, see Abstract, Fig. 3-5). Even a very small region may be critical for activity, and the criticality of a particular region must be determined empirically (Kim et al,1994, Plant Mol. Biol. 24:105-117, see Tables 1-4, Abstract, Fig. 1-2).

As the specification does not describe the transformation of any plant with nucleic acids that hybridize to SEQ ID NO:5, that have 70, 80 or 90% identity to SEQ ID NO:5, or that are

promoters comprising at least 20 contiguous nucleotides of SEQ ID NO:5, and wherein the nucleic acid is operably linked to a heterologous nucleic acid, undue trial and error experimentation would be required to screen through the myriad of nucleic acids encompassed by the claims and plants transformed therewith, to identify those that express the heterologous nucleic acid, if such plants are even obtainable.

Given the claim breath, unpredictability in the art, and lack of guidance in the specification as discussed above, the instant invention is not enabled throughout the full scope of the claims.

8. Claims 1-11 and 22-25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to a multitude of DNA molecules that nucleic acids that hybridize to SEQ ID NO:5, that have 70, 80 or 90% identity to SEQ ID NO:5, or that are promoters comprising at least 20 contiguous nucleotides of SEQ ID NO:5. In contrast, the specification only describes a promoter that comprises SEQ ID NO:5. Applicant does not describe other DNA molecules encompassed by the claims, and the structural features that distinguish all such nucleic acids from other nucleic acids are not provided.

Additionally, claims 1 and 11 do not describe the function of the claimed nucleic acids.

Hence, Applicant has not, in fact, described DNA molecules that hybridize to SEQ ID NO:5, that have 70, 80 or 90% identity to SEQ ID NO:5, or that are promoters comprising at

least 20 contiguous nucleotides of SEQ ID NO:5 within the full scope of the claims, and the specification fails to provide an adequate written description of the claimed invention.

Therefore, given the lack of written description in the specification with regard to the structural and physical characteristics of the claimed compositions, it is not clear that Applicant was in possession of the genus claimed at the time this application was filed.

See *Univ. of California v. Eli Lilly*, 119 F.3d 1559, 43 USPQ 2d 1398 (Fed. Cir. 1997):

> The name cDNA is not in itself a written description of that DNA; it conveys no distinguishing information concerning its identity. While the example provides a process for obtaining human insulin-encoding cDNA, there is no further information in the patent pertaining to that cDNA's relevant structural or physical characteristics; in other words, it thus does not describe human insulin cDNA .... Accordingly, the specification does not provide a written description of the invention ....

and at pg 1406:

> a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA," without more, is not an adequate written description of the genus because it does not distinguish the genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function, as we have previously indicted, does not suffice to define the genus because it is only an indication of what the genes does, not what it is.

See *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ 2d 1016 at page 1021:

> A gene is a chemical compound, albeit a complex one, and ... conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials .... Conception does not occur unless one has a mental picture of the structure of the chemical or is able to define it by its method of preparation, its physical or chemical properties, or whatever characteristics sufficiently distinguish it. It is not sufficient to define it solely by it principal biological property, *e.g.*, encoding human erythropoietin, because an alleged conception having no more specificity than that is simply a wish to know the identity of any material with that biological property.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-11 and 18-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Dependent claims are included in all rejections.

Claim 1, part (c), is indefinite in its recitation of "highly stringent conditions". It is not clear what hybridization and wash conditions are considered highly stringent. Thus, the metes and bounds of the claimed nucleic acid are unclear.

Claim 8, part (a) lacks antecedent basis for the limitation "promoter of claim 1" as claim 1 is drawn to an isolated nucleic acid molecule.

Claim 19, part (a), lacks antecedent basis for the limitation "promoter of claim 13" as claim 13 is drawn to a recombinant expression cassettes. This reference to a promoter of claim 13 also makes it unclear what is linked to the heterologous nucleic acid.

Claims 7 and 18 are indefinite in their recitation of "Transgenic seed". Only half the seeds of a transgenic plant will have the recombinant expression cassette with which the parent plant has been transformed. Thus, it is not clear if the claimed transgenic seed is a seed transformed with any nucleic acid or a seed transformed with the recombinant expression cassette. If the latter is intended, it is suggested that --, wherein the seed comprises the recombinant expression cassette-- be inserted before the period.

Claim 8, part (b) and claim 19, part (b) are indefinite in their recitation of "plant growing conditions". These conditions are not defined. Also, plant growth conditions are generally quite different than the conditions required to regenerate a plant from a plant cell. It is suggested that part (b) as recited be replaced with --(b) regenerating a plant from the plant cell--.

Claim 8, part (c) and claim 19, part (c) are indefinite in their recitation of "allowing expression". It is unclear what one does to allow expression of a nucleic acid or what was done in previous steps to prevent expression of the nucleic acid.

In claim 22, it is unclear if the phrase starting with "comprising" is intended to modify "gene" or "nucleic acid". If the latter, it is suggested that "comprising" be replaced with --, wherein the nucleic acid comprises--.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

12. Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by SanMiguel et al (1998, GenBank Accession No. AF050451).

SanMiguel et al teach an isolated nucleic acid the comprises a nucleic acid with 90.9% identity to SEQ ID NO:5 (see sequence search report).

13. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Quayle et al (1992, GenBank Accession No. X58700).

Quayle et al teach an isolated nucleic acid the comprises a nucleic acid with 83.0% identity to SEQ ID NO:5 (see sequence search report).

14. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by (Uknes et al, US Patent 5,986,082, filed December 1996).

Uknes et al teach an isolated nucleic acid the comprises a promoter that would hybridize to SEQ ID NO:5 under "highly stringent conditions", recombinant expression cassettes comprising this promoter, vectors, cells, plant and seeds comprising the recombinant expression cassette, and a method for expressing a heterologous nucleic acid in a plant (column 28, line 65, to column 29, line 4 and column 29, lines 28-40).

15. Claims 11-21 are free of the prior art, given the failure of the prior art to teach or suggest an isolated nucleic acid comprising SEQ ID NO:5 or having at least 90% identity to SEQ ID NO:5. Claims 22-25 are free of the prior art, given the failure of the prior art to teach or suggest an promoter comprising at least 20 contiguous nucleotides of SEQ ID NO:5.

Allowable Subject Matter

16. Claim 12 is allowed for the reasons indicated above.

17. Claim 13 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

18. Claims 14-17 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims and to overcome the objection set forth in this Office action to the claim 13.

19. Claim 18 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and the objection, both set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

20. Claim 19 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and the objection, both set forth in this Office action.

21. Claims 20-21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Customer Service at (703) 308-0198.

Anne R. Kubelik, Ph.D.
March 19, 2003